

**CLAIMS**

1. A process for the production of titanium dioxide comprising the following steps:
  - (a) a titanium ore containing iron is reacted with an aqueous NH<sub>4</sub>F solution;
  - (b) the aqueous suspension thus obtained is filtered with consequent separation of a sludge fraction and a filtrate fraction;
  - (c) the filtrate fraction thus obtained is subjected to an hydrolysis reaction;
  - (d) the thus-obtained solid component is subjected to a thermal hydrolysis reaction.
2. A process according to claim 1, characterized in that the sludge fraction of step (b) contains ammonium fluoroferates.
3. A process according to any one of the preceding claims, characterized in that the filtrate fraction of step (b) contains ammonium fluorotitanates.
4. A process according to any one of the preceding claims, characterized in that step (a) is performed at 100-120°C.
5. A process according to any one of the preceding claims, characterized in that step (a) is performed at a pressure of about 1-2 bar.
6. A process according to any one of the preceding claims, characterized in that step (a) is performed at a pH of about 6.5-7.0.
7. A process according to any one of the preceding claims, characterized in that the aqueous NH<sub>4</sub>F solution has a concentration of 30-60% by weight, preferably about 45%.
8. A process according to any one of the preceding claims, characterized in that the thermal hydrolysis reaction (c) is performed in two reactors.
9. A process according to claim 8, characterized in that the first reactor is maintained at a temperature of up to 350° C.
10. A process according to claim 8, characterized in that the first reactor is maintained at a temperature of up to 300-350° C.

11. A process according to claim 8, characterized in that the second reactor is maintained at a temperature of up to 900° C.
12. A process according to claim 8, characterized in that the second reactor is maintained at a temperature of up to 800-900° C.
13. A process according to claim 8, characterized in that the body of the first and/or second reactor is made of a chromium-nickel alloy.
14. A process according to claim 8, characterized in that the internal surface of the first reactor is made of magnesium or a graphite-reinforced polymer or vitreous carbon.
15. A process according to claim 8, characterized in that the internal surface of the second reactor is made of silica.
16. A process according to any one of the preceding claims, characterized in that the aqueous dispersion obtained from the hydrolysis reaction (c) is filtered before the thermal hydrolysis reaction (d).
17. A process according to any one of the preceding claims, characterized in that the sludge fraction of step (b) is subjected to a thermal hydrolysis reaction.
18. A process according to claim 17, characterized in that said thermal hydrolysis is performed at a temperature of up to 300-350° C.
19. A process according to claims 17-18, characterized in that the sludge fraction of step (b) is dehydrated and dried before being subjected to said thermal hydrolysis.
20. A process according to any one of the preceding claims, characterized in that the titanium ore containing iron is ilmenite.